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A Review of Theories on Technology Acceptance: The Case of Mobile Banking User Retention in Saudi Arabia

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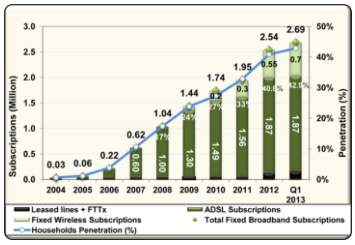
Graphical abstract



Abstract

Mobile technologies have become a crucial functional element of modern organizations. They provide uninterrupted access to information, regardless of the user's geographic location and time. Customer service, quality, satisfaction and retention are key proponents of measuring success and profitability in any organization. Due to the exponential growth of information technology, banks face dual competitive pressures to provide service quality and administrative efficiency. Accordingly, banks need to retain their existing users of mobile banking (m-banking) services to be able to benefit long term from this sustained usage behavior. The problem for banks is that the current understanding of determinants of m-banking sustained usage is limited. We propose some modifications to the DeLone and McLean Model (2003) of Information Systems Success in light of descriptive and relational studies, whereby the universal model may be applicable in post adoption user retention context. Using the findings of the review of theories and models, banks in Saudi Arabia can improve their m-banking strategies to achieve higher retention rates of existing users of m-banking services. While this study focused on m-banking user retention in the Saudi Arabian context catering to post adoption scenario, the purpose of this study is also to establish a universal measurement model for post adoption user perception of m-banking services, with global applicability.

Keywords: Mobile banking; user retention; post adoption; DeLone and McLean model; Saudi Arabia

1.0 INTRODUCTION

The internet has revolutionized as well as successfully penetrated workspaces, industries, households, and this rapid expansion of various communication technologies have greatly affected all spheres of life [1]. Technological developments particularly in the area of telecommunications and information technology are transforming the banking industry. In lieu of technological advances and developments, banks have equally responded to the challenge of competition by adopting online banking strategy that fixates on endeavoring to build customer gratification [2]. Specifically, with regards to the banking industry, due to the convergence of internet and mobile phones, mobile banking (m-banking) has emerged, touching new heights of technological marvels [3].

From the banks perspective, m-banking primarily offers cost savings [4], and from the customer's perspective, convenience, accessibility, flexibility, availability, and versatility of usage remain formidable advantages [5], while according to Sherman, mobile devices reduce costs, increase reach and enable omni-channel business processes [6].

In this increasingly competitive and changing world of online services, customer satisfaction and retention has emerged as a strategic edge for most organizations. While it is extremely important that online service providers know how to improve customer satisfaction, it was shown in a study conducted by Mittal and Kamakura that managers who aim at merely satisfying rather than completely satisfying customers run the risk of undermining customer retention [7]. In emerging markets, mobile phone usage is a major driver of economic growth. In many parts of India, China, Africa, the Middle East, and Latin America, mobile devices deliver services that in the past required huge investments in physical infrastructure as well as technological resources. In many instances, due to a shorter learning curve, mobile technology befits a country to move directly to providing an array of essential services to end-users [8].

Undoubtedly, service quality and customer perceived value are fundamental to successful business since they are crucial to customers' decisions making. Predominantly in the context where online service, consumers are becoming more informed and are willing to share their experiences through social media [9]. More specifically, dramatic advancement of mobile device technologies, and the widespread of information and

communication technologies worldwide, banks have been enabled to offer majority of their services through the m-banking service channel. Since m-banking is potentially beneficial to both banks and m-banking users, this banking service channel has become one of the most popular ways of offering and receiving banking services [10].

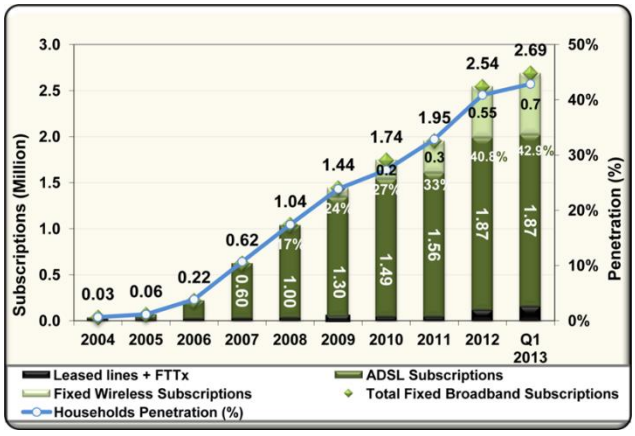


Figure 1 The progress of mobile broadband market in KSA. *Source*: (CITC, 2013)

M-banking involves the use of a mobile phone or another mobile device to undertake financial transactions linked to a client's account. As one of the newest approaches to the provision of financial services through information communication technology (ICT), made possible by the widespread adoption of mobile phones even in low income countries, and through their study they found that m-banking has the potential to bring basic banking and electronic transactions services to unbanked consumers in developing markets [11]. Kingdom of Saudi Arabia (KSA) is one of the newest entrants to the world of internet communication technologies as internet was publically made available during the mid-1990s [12]. According to CITC, major development of ICT in the Kingdom was witnessed in early 2000 when the Telecom Act was first approved [13]. Figure 1 depicts rapid growth and adoption of mobile technologies in KSA.

Interestingly, CITC report stipulates total number of mobile subscriptions in KSA reached around 51 million by the end 2013, with penetration rate of 169.7%, whereas, the estimated number of internet users was 16.5 million at the end of 2013, with a population penetration of 55.1% [14]. For instance, Luarn and Lin postulated that traditional branch-based banking is yet the most common method of banking operations and transactions [15], however, m-banking is rapidly changing the way financial and transactional services are delivered and performed. Essentially, m-banking is a newly introduced banking service for providing different monetary services via Information and Communication Technologies (ICT) and mobile devices, which facilitates the use of e-banking even in emerging countries [16]. Zhou, however, stressed the importance of identifying factors affecting low mobile banking user adoption in the context of trust and flow [17].

In light of exponential growth of mobile technology as well as consumer adoption, majority large banks in KSA have made substantial investments in mobile banking capabilities in order to cope up with rising demand. The sheer power of mobile banking services include full access to the details and transactions of personal bank accounts, as well as making credit installment and utility bill payments and transferring funds instantaneously [18]. For example, Saudi Arabian based SAMBA bank offers a fully transactional service that allows its customers to access their accounts using a single login method, make payments and transfer funds through their mobile phones or personal computer anytime, anywhere [18].

As noted earlier, m-banking industry is relatively in its infancy in KSA, yet growing almost at an exponential rate. Similar to other innovation diffusion contexts in which the technology adoption phenomenon is divided into two levels of adoption including initial adoption and post adoption (e.g. [19, 20, 21]). M-banking adoption can also be studied at two levels: initial m-banking adoption and post m-banking adoption [10]. Contrary to the initial adoption of m-banking which is well-studied, the existing knowledge of the way current m-banking users are retained and persuaded to use this service again is yet limited. This important existing evidence within the literature suggests that similar to other service industries, lack of understating on determinants of customer retention can be costly to banks which have made considerable amount of investments to provide m-banking services and technological support [22, 23].

In a recent study by Van der Boor *et al*., examined the extent to which users in emerging countries innovate, the factors that enable these innovations and whether they are meaningful on a global stage [24]. It is important to note that while literature is exhaustive of pre-adoption studies, it is limited in terms of post-adoption context. This is further aggravated in the Saudi Arabian m-banking context, and it is also noteworthy to highlight between pre-adoption and post adoption at this point. Generally, new technology is innovative as well as attractive; however, measuring the post adoption and retention rates may posit greater challenges.

The spread of mobile phones across the developing world is one of the most significant technology stories of the past decade. Products such as prepaid cards coupled with inexpensive mobile sets, hundreds of millions of first-time telephone owners have made voice calls and text messages part of their circadian lives. However, many of these same embryonic mobile users live in cash economies, without access to financial service that others take for granted. Indeed, across the developing world, there are probably more people with mobile handsets than with bank accounts [25]. Similarly, according to Maurer, scholarly research on the adoption and socioeconomic impacts of m-banking systems in the developing world is scarce [26]. Donner and Tellez argued that that contextual research is a critical input to effective adoption or impact research [27].

While reviewing possible factors that could affect an individual's decision to accept or reject technologies, individuals' attitudes toward accepting and adopting newly introduced technologies determine the success or failure of such technologies were determined by [2, 28]. Since m-banking is a relatively new technological innovation, majority of previous studies has addressed the initial adoption stage in which non-users of m-banking decide to whether adopt this new banking service. Nowadays, banks are aware that if the their customers perceive that m-banking is useful, easy to use, secure, and compatible with their banking preferences, customers are highly likely to switch from alterative banking services to m-banking (e.g., [29, 30]).

While banks may have been successful in attracting customers to switch to m-banking, equally important are the steps taken by the institution to retain customers [10]. Accordingly, banks need to retain their existing users of m-banking services to be able to benefit long term from this sustained usage behavior. The problem for banks is that the current understanding of determinants of m-banking sustained usage is limited, and drawing on existing evidence from other contexts, it is likely that the long-term benefits of banks from m-banking service be negatively affected by this lack of understanding.

Despite our limited understanding of determinants of customer retention in m-banking context, the existing literature on corresponding research contexts (e.g., online shopping) revealed that instead of perceptual-cognitive factors which are important to initial adoption, the technical characteristics of the e-service (e.g., system and information quality), in addition to post-use-related factors such as satisfaction with the e-service are key determinants of post adoption behavior (retention) of existing customers (e.g., [31, 32, 33, 34]). Accordingly, a detailed study of the mechanism by which banks can retain their users of m-banking services can be useful to banks and to the ever-more growth of m-banking industry.

This study therefore aims to address the need for understanding the phenomenon of m-banking customer retention in the form of studying determinates of intention to reuse m-banking services by existing users, in KSA in particular. Although some recent studies (e.g., [2, 18, 35]) have tried to explore the determinants of initial adoption of m-banking within KSA, however, there is a considerable lack of knowledge on determinants of post adoption m-banking user retention, the gap this study attempts to address. With that said, huge gap exists in ascertaining the m-banking user retention in post adoption framework.

The upshot of above discussion entails significant gaps in the context of M-banking user retention in post adoption context which can be listed as follows:

1. Lack of an existing research model that can explain the mechanism by which existing users of a particular m-banking service can be retained; and
2. Lack of detailed guideline available to Saudi Arabian banks to assist them with devising better customer retention strategies in the context of m-banking services.

For the purpose of this study, in order to assess mobile banking user retention, among several others, we identified several key theories and models such as Diffusion of Innovation (DOI) by Rogers [36, 37], Technology Acceptance Model (TAM) by Davis [38], and Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh *et al*. [39], while utilizing and proposing modification of Delone and MacLean Model (2003) of Information Systems (IS) success [40] and Integrated Model of Trust and Intended Use by Gefen *et al*. [41], to assess mobile banking user retention in Saudi Arabia in post adoption context.

Additionally, we incorporated dominant social psychology theories of similar context such as the Theory of Reasoned Action (TRA) by Fishbein and Ajzen [42], the Theory of Planned Behavior (TPB) by Ajzen [43], Social Cognitive Theory by Bandura [44], Commitment Trust Theory by Morgan and Hunt [45], and Perceived Risk Theory by Roselius [46] to further strengthen our research. It is pertinent to note that numerous researchers have attempted to utilize, develop, and adapt the aforementioned theories to study the adoption of new technologies [16], using models and theories earlier stated.

2.0 LITERATURE REVIEW

This section reviews the most prominent technology acceptance theories and models. Due to the importance of user attitude, acceptance, and behavior toward increased adoption of IT tools, there are plenty of theories that attempt to understand, explain, and anticipate the new technologies' acceptance among users. Among these theories, the following theories were found to be most popular, influential, important, and above all pertinent to our context of study:

- The Diffusion of Innovations Theory (DOI) by Rogers;
- The Technology Acceptance Model (TAM) by Davis;
- The Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh *et al*.;
- Delone and MacLean Model (2003) of Information Systems (IS) Success;
- The Integrated Model of Trust and Intended Use by Gefen *et al*.

A majority theories and models used by Information Systems (IS) scholars consider intention to use or usage behavior as the central phenomenon to study the determinants of intention to use, IS, and usage behavior. Past studies have concluded that consumers' new technology adoption behavior is a complicated phenomenon which requires different models in different product contexts [47]. Accordingly, these theories and models are useful for the study of initial as well as post adoption IS context.

2.1 Diffusions of Innovations Theory (DOI)

The DOI theory proposed by Rogers [37] is one of the most popular models in investigating the behavior of potential users in adopting new technological innovation. This theory, as depicted in Figure 2, which stipulates that that an individual first acquires knowledge about a new innovation, subsequently being persuaded towards implementation.

The persuasion part of DOI proposes five different perceived characteristics:

1. Relative advantage that refers to the extent to which an individual perceives that a particular innovation is better than what it supersedes;
2. Compatibility that refers to the extent to which an individual believes that a particular innovation is consistent with existing values, earlier experiences and current needs;
3. Complexity that is concerned with the degree to which an individual believes that a particular innovation is difficult to understand and use;
4. Trialability that refers to the extent to which an individual perceives that a particular innovation can be experimented on a limited basis; and
5. Observability that refers to the extent to which the results of a new innovation is visible to individuals.

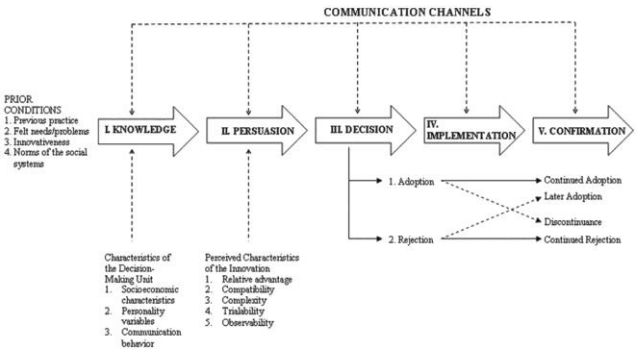


Figure 2 Diffusion of innovation model

DOI theory further postulates that while an individual is persuaded to implement new innovation, the decision as to whether to implement it or not is made. After the implementation phase, the individual confirms the previous adoption or rejection decision [37]. In sum, DOI proposes that technological ideas, practices or objects as innovation are communicated via particular

channels over a period of time within members of a social system [48].

2.2 The Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) explains how users come to accept and use an IS [49]. TAM as one the most important extensions of TRA proposes that external stimulus (e.g., system design) determine two cognitive responses of perceived ease of use and perceived usefulness. TAM further explains that attitude toward using a system is a function of perceived ease of use and perceived usefulness which, in turn, determines behavioral response toward the system [38]. Figure 3 shows the TAM as proposed by Davis. He argued that although TRA is a well-researched intention model which has been successful in predicting the behavior in a variety of domains [38], however it is too general and in some cases, previous scholars miss-used it in predicting difference sorts of beliefs and predicting the behavior. Davis first proposed an extension of TRA which was particularly developed for assessing the usage behavior in IS background.

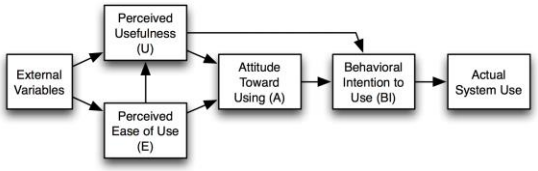


Figure 3 Technology Acceptance Model (TAM)

Due to the lack of valid measurement scales for measuring user acceptance of IS, Davis developed and validated a measurement instrument for the two cognitive variables of perceived ease of use and perceived usefulness, and further demonstrated that both cognitive beliefs were significantly correlated with current and future usage behavior [38]. His empirical comparison of TAM and TRA showed that TAM is reliable to study the usage behavior in the IS context, which implies that TRA's subjective norms can be excluded as potential determinants of usage behavior.

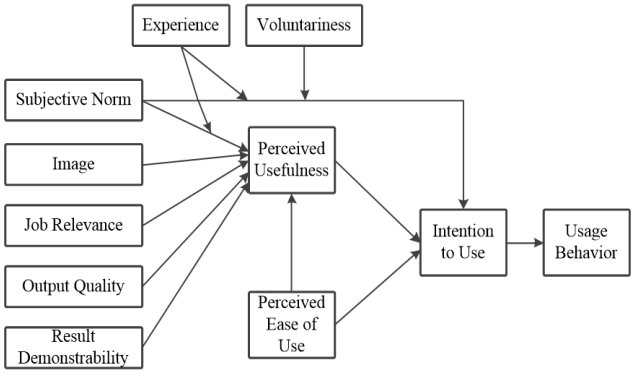


Figure 4 Technology Acceptance Model 2 (TAM2)

Davis further empirically tested the TAM in the case of usage of two end-users systems and demonstrated that "TAM provides an informative representation of the mechanisms by which design choices influence user acceptance, and should therefore be helpful in applied contexts for forecasting and evaluating user acceptance of information technology" [49]. He also observed that, in case of his study, perceived usefulness was significantly more influential than ease of use in predicting system usage [49]. Although Davis in the original TAM did not acknowledge the significance of subjective norms, however, the extended version of TAM, namely TAM2, which was proposed by Venkatesh and Davis, acknowledged the importance of subjective norms, as well as many other external variables [50]. More importantly, attitude toward using a system was excluded in TAM2.

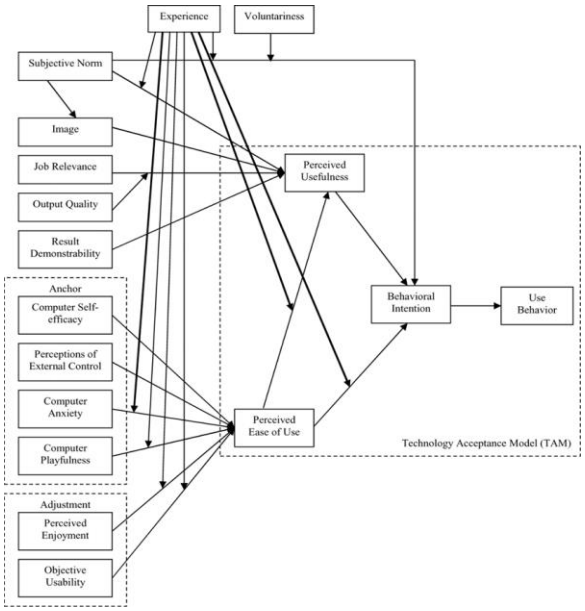


Figure 5 Technology Acceptance Model 3 (TAM3)

Venkatesh and Davis also noted that TAM2 was a strong model of assessing the usage behavior of system at the organizational level and empirically demonstrated that "subjective norm exerts a significant direct effect on usage intentions over and above perceived usefulness" [50]. Figure 4 shows TAM2. Two decades later since first TAM and TAM2, Venkatesh and Bala reviewed various criticisms and proposed TAM3 as shown in Figure 5 [51]. TAM3 entailed "comprehensive integrated model of the determinants of individual level (IT) adoption and use; empirically test the proposed integrated model; and presented research agenda focused on potential pre- and post-implementation interventions that enhance adoption and use of IT" [51].

Several recent studies conducted by Behrend *et al.* and Pookulangara and Koesler drew on TAM3 to ascertain organizational adoption and use of IS, and provided empirical evidence for robustness of TAM3 [52, 53].

2.3 The Unified Theory of Acceptance and Use of Technology (UTUAT)

Venkatesh *et al.* reviewed existing theories and models on acceptances of new technologies (including IT) and proposed The Unified Theory of Acceptance and Use of Technology (UTAUT) through reviewing and integrating eight prominent models of TRA, TAM, the motivational model, TPB, DTPB, DOI, and the social cognitive theory [39]. As depicted in Figure 6, UTAUT proposed that performance expectancy, effort expectancy and social influence are direct determinants of behavioral intention.

This model also proposed usage behavior as the function of facilitating conditions and behavioral intention. Moreover, UTAUT assumes that gender, age, experience and voluntariness of use are the potential moderators of the hypothesized relationships. Key antecedent determinants of UTAUT are defined as following:

- Performance expectancy that refers to the extent to which an individual perceive that using the system enables her/him to have higher job performance;
- Effort expectancy that measures to what extent the usage of a system is associated with ease of use;
- Social influence that refers to the extent to which "individual perceives that important others believe he or she should use the new system" [39];
- Facilitating conditions that refer to the extent to which an individual perceives that the use of a system is supported by existing organizational and technical infrastructure.

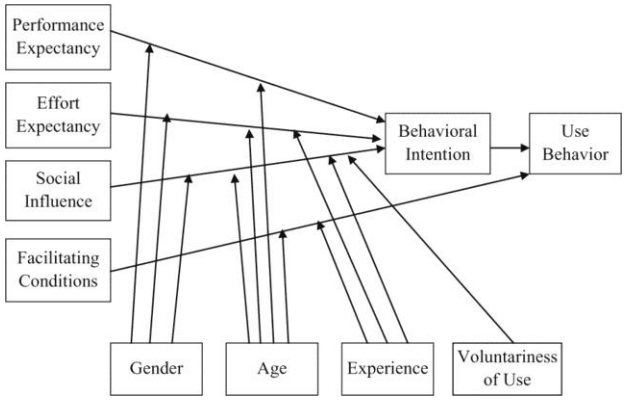


Figure 6 The Unified Theory of Acceptance and Use of Technology (UTAUT)

As compared to other models such as TAM, UTAUT sacrifices parsimoniousness to offer relatively higher comprehensiveness and better practical implications. Several researchers have empirically tested its validity and reliability, while practically testing UTAUT model and reported that UTAUT as robust measure that effectively explained determinants of intention to use and usage behavior [28, 54, 55]. We conclude that TAM is a useful model, but has to be integrated into a broader one which would include variables related to both human and social change processes, and to the adoption of the innovation model [56]. Figure 6 highlights the UTAUT.

2.4 The DeLone and McLean Model of Information Systems (IS) Success

Consistent with a number of previous Electronic Commerce (EC) and Information Systems (IS) studies proposing the robustness and appropriateness of the DeLone and McLean Model (2003) of Information Systems Success taxonomy as a robust theoretical basis for the study of IS post-adoption, this study primarily builds on the DeLone and McLean Model (2003). It is our contention that the DeLone and McLean Model (2003) of Information Systems Success is the most robust theoretical basis for measuring m-banking post-adoption behavior (customer retention) mainly because of its comprehensiveness and well-established and tested framework, whose proposed associations and interrelationships have been validated by a wide variety of empirical studies in different EC and IS context [33, 57, 58, 59]. Secondly, there are numerous reliable and validated measures that can be reused to assess the proposed success dimensions [60]. Thirdly, the updated DeLone and McLean Model (2003) of Information Systems Success proves well, as compared to the original model (1992) [61], which was not empirically tested [62]. Finally, despite some recommendations for extension to the DeLone and McLean Model (2003) taxonomy already acknowledged by DeLone and McLean [40], there are negligible studies arguing that the conceptualization of constructs of IS success and their interrelationships are inaccurate.

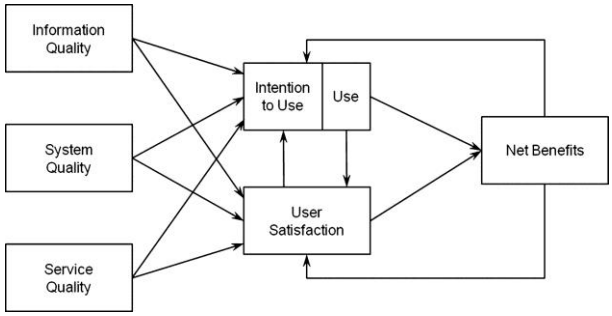


Figure 7 Delone and Mclean Model (2003)

While the DeLone and McLean Model (2003) taxonomy is a useful, robust and parsimony framework for understanding key dimensions of EC and IS service usage behavior and their interrelationships, however, many IS scholars argue that there is a need to incorporate cognitive factors and beliefs as potential determinants of EC and IS service usage behavior (e.g., [63, 64]). Majority of previous studies in m-banking context which drew on the DeLone and McLean Model taxonomy also proposed significant extensions to include different cognitive factors and beliefs such as attitude, trust and perceived usefulness. These extensions however cannot be regarded as a disadvantage diminishing its robustness since as DeLone and McLean noted that "for each research endeavor, the selection of IS success dimensions and measures should be contingent on the objectives and context of the empirical investigation …," [40]. Figure 7 postulates the updated DeLone and McLean Model.

Therefore, these extensions of the DeLone and McLean Model (2003) of Information Systems Success taxonomy are indeed expected and requested. It was observed that majority of the extensions to success taxonomy are completed via integrating the dimensions of IS success offered by this taxonomy with well-established perceptual-cognitive variables and beliefs identified within technology acceptance background. The most common practice is to integrate with well-known acceptance theories such as DOI, TAM, TPB, TRA, and UTAUT. In majority of previous papers, the DeLone and McLean Model (2003) was considered as the main basis which extended by adding some other system characteristics or personal beliefs (e.g., [65, 66]), however, there are some cases in which the DeLone and McLean Model (2003) is not the main theoretical bases, rather it is used to extend other technology acceptance theories, for example by adding system quality or information identified by the taxonomy (e.g., [67]).
Consistently, and for the purpose of research model development, the study builds on the DeLone and McLean Model (2003) as the main theoretical basis. This selection particularly supports the main objective of the study which is to assess determinants of m-banking user retention.

2.5 The Integrated Model of Trust and Intended Use

As mentioned previously, the present study is also regarded as a marketing study since it intends to understand how users of m-banking service from particular banks are retained, Oliver defined brand loyalty as "a deeply held commitment to rebuy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior" [68].

Following upon this notion, Chaudhuri and Holbrook argued that marketing literature acknowledged two different dimensions of loyalty namely attitudinal loyalty and behavioral loyalty, and highlighted that behavioral or loyalty pertains to consistent repeated purchases of the brand [69].

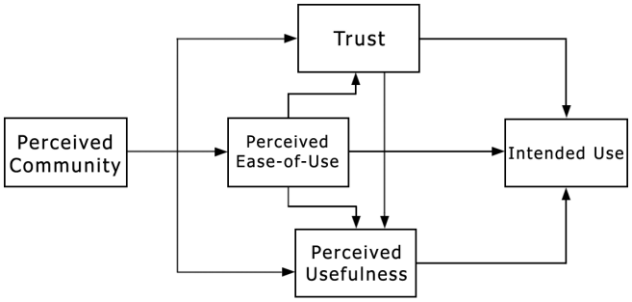


Figure 8 The Integrated Model of Trust and Intended Use

Subsequently, Gefen *et al.* proposed their integrated model of acceptance through integrating TAM with trust background, which suggested that trust is the direct determinant of perceived usefulness and indented use [41]. According to Gefen *et al*., "recognizing both technological and trust issues is important in increasing consumers' intended use of the Web site and, through it, transactions with the e-vendor" [41]. Figure 8 depicts the integrated model of trust and intended use.

While Hernández-Ortega further clarified relationship between trust and technology acceptance important implications about trust-building structures that could improve the application of technologies that are in the early stages of implementation [70], Gefen *et al*. model also showed that "repeat customer's purchase intentions were influenced by both their trust in the e-vendor and their perception that the website was useful, potential customers were not influenced by perceived usefulness, but only by their trust in the e-vendor" [41]. It is quite evident that intention to reuse m-banking is indeed an indented, but repeated use of m-banking. Therefore, the present study proposes that trust deserves to be included as a potential direct determinant of m-banking user retention.

■3.0 CONCLUSION

We focused on m-banking user retention catering to post adoption scenario. DeLone and McLean and Gefen *et al*., for instance, catered for both psychological processes as expounded upon earlier, as well as user satisfaction within m-banking, loyalty, post-use trust, intention to reuse-all crucial to understanding and ascertaining m-banking user retention. Accordingly, we proposed a single and universally applicable, yet comprehensive model essentially encompassing descriptive as well as relational studies to ascertain user retention in post adoption context. Following the conceptualization of Bandyopadhyay and Martell, and Dick and Basu [71, 72], this study acknowledges the complexity of the loyalty construct, and for the first time in the context of the m-banking proposes that attitudinal loyalty is an antecedent variable to the behavioral loyalty (intention to reuse in this study). Moreover, and although majority of existing studies on m-banking adoption focused at the initial trust as a potential determinates of m-banking usage behavior (e.g., [17]), this study also introduces the concept of post-use trust by Hernández-Ortega as noted earlier.

We proposed a comprehensive research model (see Figure 9), further building upon DeLone and McLean (2003) taxonomy with specific regards to the KSA m-banking user retention post adoption context. This enabled us to not only study to respond to the calls from previous studies to cover existing research gaps in m-banking context, but proposed research model is indeed a direct response to the recommendation by Al-Somali *et al*. that: "future studies could further extend the TAM model to include other variables such as customer loyalty to Internet banking, cost, perceived value and perceived risk" [2].

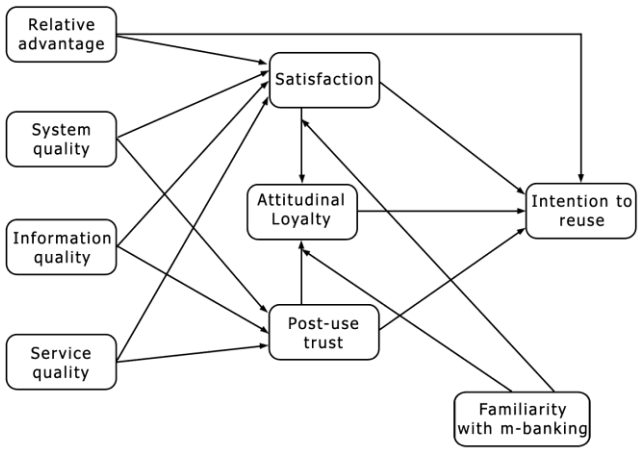


Figure 9 Proposed model

Hammond *et al*. in their study of consumer perceptions of Internet Banking in moderating role of familiarity found that consumers' prior experience and expertise were essential moderators of their attitudes towards the internet [73]. In similar context, following guidelines set forth by Aiken and West [74], we proposed a moderator 'familiarity with m-banking' to test interaction effects of significant variables such as loyalty, satisfaction, and trust [67]. According to Frazier *et al.* "Whereas moderators address "when" or "for whom" a predictor is more strongly related to an outcome, mediators establish "how" or "why" one variable predicts or causes an outcome variable" [75]. Liébana-Cabanillas *et al*. proposed and tested an integrative theoretical model that allowed determination of the relative importance of certain factors (i.e. external influences, ease of use, attitude, usefulness, trust, risk) for the adoption of a new mobile payment system, as well as to analyze the eventual moderating effect of the age of the consumer [76]. The results showed that the age of the user introduced significant differences in the proposed relationships between influences from third parties and ease of use of the payment system, between the perceived trust in the system and its ease of use, as well as between trust and a favorable attitude towards its use.

Park *et al*. investigated the influences of loyalty and switching costs to a firm's overall post-adoption behavior in using information system. Their findings suggested that both loyalty and

switching costs have positive influences on the continuous intention to use and the inattentiveness of alternatives [77]. Molina and Moreno evaluated the impact that familiarity or user experience has on the relationship between transparency and trust and between this and continued use [78]. Lee and Chung recommended that "Since mobile banking is a relatively new application, users can experience varying degrees of quality and trust. Specifically, the degree of satisfaction could be tied to how familiar users are with mobile banking. Further analysis is necessary, including using respondents' degree of familiarity with mobile banking as a moderate variable" [65]. IS literature suggested that experience with a system can moderated the relationships between potential determinants and the acceptance behavior (e.g., [41, 51, 79, 80, 81]). Thus, the role of familiarity with m-banking as a moderator emerges as an important factor, hence giving due justification to our proposed model.

References

[1] Schneider, G. 2006. *Business Strategies*. Andy Pickering, Boston, Thomson Course Technology.

[2] Al-Somali, S. A., Gholami, R., & Clegg, B. 2009. An investigation into the acceptance of online banking in Saudi Arabia. *Technovation*. 29(2): 130–141.

[3] Barnes, S. J., & Corbitt, B. 2003. Mobile Banking: Concept and Potential. *International Journal of Mobile Communications*. 1(3): 273–288.

[4] Makris, M., Koumaras, V., Koumaras, H., Konstantopoulou, A., & Konidis, S. 2009. Quantifying Factors Influencing the Adoption of Internet Banking Services in Greece. *International Journal of E-Adoption (IJEA)*. 1(1): 20–32.

[5] Steinfield, C., Bouwman, H., & Adelaar, T. 2002. The Dynamics of Click-and-Mortar Electronic Commerce: Opportunities and Management Strategies. *International Journal of Electronic Commerce*. 7: 93–120.

[6] Sherman, M. 2014. An Introduction to Mobile Payments: Market Drivers, Applications, and Inhibitors. *In Proceedings of the 1st International Conference on Mobile Software Engineering and Systems*. ACM. 71–74.

[7] Shah, G. U. D., Bhatti, M. N., Iftikhar, M., Qureshi, M. I., & Zaman, K. 2013. Implementation of Technology Acceptance Model in E-Learning Environment in Rural and Urban areas of Pakistan. *World Applied Sciences Journal*. 27(11): 1495–1507.

[8] Krishnan, S. 2014. *The Power of Mobile Banking: How to Profit from the Revolution in Retail Financial Services*. Hoboken, New Jersey: John Wiley & Sons, Inc. 1–29.

[9] Marimon, F., Petnji Yaya, L. H., & Casadesus Fa, M. 2012. Impact of e-Quality and Service Recovery on Loyalty: A Study Of E-Banking in Spain. *Total Quality Management & Business Excellence*. 23(7–8): 769–787.

[10] Kang, H., Lee, M. J., & Lee, J. K. 2012. Are You Still With Us? A Study of the Post-Adoption Determinants of Sustained Use of Mobile-Banking Services. *Journal of Organizational Computing and Electronic Commerce*. 22(2): 132–159.

[11] Anderson, J. 2010. M-banking in Developing Markets: Competitive and Regulatory Implications. *Info*. 12(1): 18–25.

[12] Al-Tawil, K. M. 2001. The Internet in Saudi Arabia. *Telecommunications Policy*. 25(8): 625–632.

[13] CITC. 2010. *The State of ICT Market Development in Saudi Arabia* (p. 139). Retrieved from http://www.citc.gov.sa/English/Reportsandstudies/Studies/Documents/PL-PM-015-E-The State of ICT Market Development in Saudi Arabia.pdf.

[14] CITC. 2013. *ICT Indicators Report*. 6. Retrieved from http://www.citc.gov.sa/English/Reportsandstudies/Indicators/Indicators of Communications and Information Techn/Indicators Q4-2013 - English - FINAL v2.pdf,

[15] Luarn, P., & Lin, H.-H. 2005. Toward an Understanding of the Behavioral Intention to Use Mobile Banking. *Computers in Human Behavior*. 21(6): 873–891.

[16] Hanafizadeh, P., Keating, B. W., & Khedmatgozar, H. R. 2014. A Systematic Review of Internet Banking Adoption. *Telematics and Informatics*. 31(3): 492–510.

[17] Zhou, T. 2012. Examining Mobile Banking User Adoption from the Perspectives of Trust and Flow Experience. *Information Technology and Management*. 13(1): 27–37.

[18] Al-Jabri, I. M., & Sohail, M. S. 2012. Mobile Banking Adoption: Application of Diffusion Of Innovation Theory. *Journal of Electronic Commerce Research*. 13(4): 379–391.

[19] Ghobakhloo, M., Arias-Aranda, D., & Benitez-Amado, J. 2011. Adoption of e-commerce Applications in SMEs. *Industrial Management & Data Systems*. 111(8): 1238–1269.

[20] Agarwal, R., & Karahanna, E. 2000. Time Flies When You're Having Fun: Cognitive Absorption and Beliefs About Information Technology Usage. *MIS Quarterly*. 24(4): 665–694.

[21] Thong, J. Y. L. 1999. An Integrated Model of Information Systems Adoption iIn Small Businesses. *Journal of Management Information Systems*. 15(4): 187–214.

[22] Mittal, B., & Lassar, W. M. 1998. Why Do Customers Switch? The Dynamics of Satisfaction Versus Loyalty. *Journal of Services Marketing*. 12(3): 177–194.

[23] Rust, R. T., & Zahorik, A. J. 1993. Customer Satisfaction, Customer Retention, and Market Share. *Journal of Retailing*. 69(2): 193–215.

[24] Van der Boor, P., Oliveira, P., & Veloso, F. 2014. Users as Innovators in Developing Countries: The Global Sources of Innovation and Diffusion in Mobile Banking Services. *Research Policy*. In Press, available online 19 June 2014.

[25] Porteous, D. 2006. *The Enabling Environment for Mobile Banking in Africa*.

[26] Maurer, B. 2008. Retail Electronic Payments Systems for Value Transfers in the Developing World. *Department of Anthropology, University of California*.

[27] Donner, J., & Tellez, C. A. 2008. Mobile Banking and Economic Development: Linking Adoption, Impact, and Use. *Asian Journal of Communication*. 18(4): 318–332.

[28] Al-Gahtani, S. S., Hubona, G. S., & Wang, J. 2007. Information technology (IT) in Saudi Arabia: Culture and the Acceptance and Use of IT. *Information & Management*. 44(8): 681–691.

[29] Chen, C. 2013. Perceived Risk, Usage Frequency of Mobile Banking Services. *Managing Service Quality*. 23(5): 410–436.

[30] Lin, H.-F. 2011. An Empirical Investigation of Mobile Banking Adoption: The Effect of Innovation Attributes and Knowledge-based Trust. *International Journal of Information Management*. 31(3): 252–260.

[31] Chiu, C.-M., Hsu, M.-H., Lai, H., & Chang, C.-M. 2012. Re-examining the Influence of Trust on Online Repeat Purchase Intention: The Moderating Role of Habit and Its Antecedents. *Decision Support Systems*. 53(4): 835–845.

[32] Kang, Y. S., Hong, S., & Lee, H. 2009. Exploring Continued Online Service Usage Behavior: The Roles of Self-Image Congruity and Regret. *Computers in Human Behavior*. 25(1): 111–122.

[33] Wang, Y. 2008. Assessing e-commerce Systems Success: A Respecification and Validation of the DeLone and McLean Model of IS Success. *Information Systems Journal*. 18(5): 529–557.

[34] Wen, C., Prybutok, V. R., & Xu, C. 2011. An Integrated Model for Customer Online Repurchase Intention. *Journal of Computer Information Systems*. 52(1): 14–23.

[35] Sohail, M. S., & Al-Jabri, I. M. 2014. Attitudes Towards Mobile Banking: Are There Any Differences Between Users and Non-Users? *Behaviour & Information Technology*. 33(4): 335–344.

[36] Rogers, E., & Shoemaker, F. (1971). *Communication of innovations: A Cross-cultural Approach*. New York: Free Press.

[37] Rogers, E. 1983. *Diffusion of Innovations*. New York: Free Press.

[38] Davis, F. D. 1989. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*. 13(3): 319–340.

[39] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. 2003. User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*. 27(3): 425–478.

[40] Delone, W. H., & McLean, E. R. 2003. The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*. 19(4): 9–30.

[41] Gefen, D., Karahanna, E., & Straub, D. W. 2003. Trust and TAM in Online Shopping: An Integrated Model. *MIS Quarterly*. 27(1): 51–90.

[42] Fishbein, M., & Ajzen, I. 1975. *Belief, Attitude, Intention and Behavior: An Introduction to Theory And Research*.

[43] Ajzen, I. 1991. The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*. 50(2): 179–211.

[44] Bandura, A. 1986. *Social Foundations of Thought and Action*. Englewood Cliffs, NJ Prentice Hall.

[45] Morgan, R. M., & Hunt, S. D. 1994. The Commitment-Trust Theory of Relationship Marketing. *The Journal of Marketing*. 58(3): 20–38.

[46] Roselius, T. 1971. Consumer Rankings of Risk Reduction Methods. *The Journal of Marketing*. 35(1): 56–61.

[47] Shen, Y.-C., Huang, C.-Y., Chu, C.-H., & Hsu, C.-T. 2010. A Benefit–Cost Perspective of the Consumer Adoption of the Mobile Banking System. *Behaviour & Information Technology*. 29(5): 497–511.
[48] Tan, K. S., Chong, S. C., Lin, B., & Eze, U. C. 2009. Internet-based ICT Adoption: Evidence from Malaysian SMEs. *Industrial Management & Data Systems.* 109(2): 224–244.
[49] Davis, F. D. 1993. User Acceptance of Information Technology: System Characteristics, User Perceptions and Behavioral Impacts. *International Journal of Man-Machine Studies.* 38(3): 475–487.
[50] Venkatesh, V., & Davis, F. D. 2000. A Theoretical Extension of The Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science.* 46(2): 186–204.
[51] Venkatesh, V., & Bala, H. 2008. Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences.* 39(2): 273–315.
[52] Behrend, T. S., Wiebe, E. N., London, J. E., & Johnson, E. C. 2011. Cloud Computing Adoption and Usage in Community Colleges. *Behaviour & Information Technology*. 30(2): 231–240.
[53] Pookulangara, S., & Koesler, K. 2011. Cultural Influence on Consumers' Usage of Social Networks and Its' Impact on Online Purchase Intentions. *Journal of Retailing and Consumer Services*. 18(4): 348–354.
[54] Bandyopadhyay, K., & Fraccastoro, K. A. 2007. The Effect of Culture on User Acceptance of Information Technology. *Communications of the Association for Information Systems*. 19(1): 23.
[55] Laumer, S., Eckhardt, A., & Trunk, N. 2010. Do as Your Parents Say?—Analyzing IT Adoption Influencing Factors for Full And Under Age Applicants. *Information Systems Frontiers.* 12(2): 169–183.
[56] Legris, P., Ingham, J., & Collerette, P. 2003. Why Do People Use Information Technology? A Critical Review of The Technology Acceptance Model. *Information & Management*. 40(3): 191–204.
[57] Rai, A., Lang, S. S., & Welker, R. B. 2002. Assessing the Validity Of IS Success Models: An Empirical Test and Theoretical Analysis. *Information Systems Research*. 13(1): 50–69.
[58] Urbach, N., Smolnik, S., & Riempp, G. 2010. An Empirical Investigation uf Employee Portal Success. *The Journal of Strategic Information Systems*. 19(3): 184–206.
[59] Zhou, T. 2011. Examining the Critical Success Factors of Mobile Website Adoption. *Online Information Review.* 35(4): 636–652.
[60] Petter, S., DeLone, W., & McLean, E. R. 2013. Information Systems Success: The Quest for The Independent Variables. *Journal of Management Information Systems.* 29(4): 7–62.
[61] DeLone, W. H., & McLean, E. R. 1992. Information Systems Success: The Quest for The Dependent Variable. *Information Systems Research*. 3(1): 60–95.
[62] Petter, S., & McLean, E. R. 2009. A Meta-Analytic Assessment of The Delone and Mclean IS Success Model: An Examination Of IS Success at The Individual Level. *Information & Management.* 46(3): 159–166.
[63] Gable, G. G., Sedera, D., & Chan, T. 2008. Re-conceptualizing Information System Success: The IS-Impact Measurement Model. *Journal of the Association for Information Systems.* 9(7): 377–408.
[64] Sabherwal, R., Jeyaraj, A., & Chowa, C. 2006. Information system Success: Individual and Organizational Determinants. *Management Science.* 52(12): 1849–1864.
[65] Lee, K. C., & Chung, N. 2009. Understanding Factors Affecting Trust In and Satisfaction With Mobile Banking In Korea: A Modified Delone and Mclean's Model Perspective. *Interacting with Computers*. 21(5): 385–392.
[66] Zhou, T. 2011. An Empirical Examination of Users' Post-Adoption Behaviour of Mobile Services. *Behaviour & Information Technology*. 30(2): 241–250.
[67] Gu, J.-C., Lee, S.-C., & Suh, Y.-H. 2009. Determinants of Behavioral Intention to Mobile Banking. *Expert Systems with Applications*. 36(9): 11605–11616.
[68] Oliver, R. L. 1999. Whence Consumer Loyalty? *The Journal of Marketing.* 63: 33–44.
[69] Chaudhuri, A., & Holbrook, M. B. 2001. The Chain of Effects From Brand Trust and Brand Affect to Brand Performance: The Role Of Brand Loyalty. *Journal of Marketing*. 65(2): 81–93.
[70] Hernández-Ortega, B. 2011. The Role of Post-Use Trust in The Acceptance of a Technology: Drivers And Consequences. *Technovation.* 31(10): 523–538.
[71] Bandyopadhyay, S., & Martell, M. 2007. Does Attitudinal Loyalty Influence Behavioral Loyalty? A Theoretical and Empirical Study. *Journal of Retailing and Consumer Services.* 14(1): 35–44.
[72] Dick, A. S., & Basu, K. 1994. Customer Loyalty: Toward an Integrated Conceptual Framework. *Journal of the Academy of Marketing Science*. 22(2): 99–113.
[73] Hammond, K., McWilliam, G., & Diaz, A. N. 1998. Fun and Work on The Web: Differences in Attitudes Between Novices and Experienced Users. *Advances in Consumer Research*. 25(1): 372–378.
[74] Aiken, L. S., & West, S. G. 1991. *Multiple Regression: Testing and Interpreting Interactions*. Sage.
[75] Frazier, P. A., Tix, A. P., & Barron, K. E. 2004. Testing Moderator and Mediator Effects in Counseling Psychology Research. *Journal of Counseling Psychology*. 51(1): 115–134.
[76] Liébana-Cabanillas, F., Sánchez-Fernández, J., & Muñoz-Leiva, F. 2014. Antecedents of the Adoption of The New Mobile Payment Systems: The Moderating Effect of Age. *Computers in Human Behavior*. 35: 464–478.
[77] Park, J.-G., Park, K., & Lee, J. 2014. A firm's post-adoption behavior: loyalty or switching costs? Industrial Management & Data Systems. 114(2): 258–275.
[78] Molina, C. M., & Moreno, R. R. 2014. The Role of Familiarity or Experience in Generating Trust and in Its Impact on Continued Use. In System Sciences (HICSS), 47th Hawaii International Conference. IEEE. 2210–2219.
[79] Elliott, M. T., & Speck, P. S. 2005. Factors that Affect Attitude Toward A Retail Web Site. *Journal of Marketing Theory and Practice*. 3(1): 40–51.
[80] Fuller, M. A., Serva, M. A., & Benamati, J. 2007. Seeing Is Believing: The Transitory Influence of Reputation Information on E-Commerce Trust and Decision Making. *Decision Sciences.* 38(4): 675–699.
[81] Nysveen, H., & Pedersen, P. E. 2004. An Exploratory Study of Customers' Perception of Company Web Sites Offering Various Interactive Applications: Moderating Effects of Customers' Internet Experience. *Decision Support Systems*. 37(1): 137–150.